## WE CLAIM:

- 1. An in-vivo tissue inspection device comprising:
- an first non-imaging light collector having an entrance and an exit;
- a second non-imaging light collector having an entrance and an exit, the second non-imaging light collector being arranged so that its entrance is in light communication with the exit of the first non-imaging light collector;

a light guide; and

an optical element, wherein the light guide is positioned between the second non-imaging light collector and the optical element.

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2. The in-vivo tissue inspection device of claim 1, wherein the first non-imaging light collector and the second non-imaging light collector are each independently selected from the group consisting of a compound parabolic collector and a compound elliptical collector.

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3. The in-vivo tissue inspection device of claim 1, wherein the first non-imaging light collector and the second non-imaging light collector are each independently selected from the group consisting of a filled non-imaging light collector and an unfilled non-imaging light collector.

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- 4. The in-vivo tissue inspection device of claim 1, wherein the first non-imaging light collector has an axial ratio of about 3:1.
- 5. The in-vivo tissue inspection device of claim 1, wherein the first nonimaging light collector has an area ratio that is about 3:1 to about 5:1.
  - 6. The in-vivo tissue inspection device of claim 1, wherein the second non-imaging light collector has an axial ratio that is about 5:1 to about 10:1.
- The in-vivo tissue inspection device of claim 1, wherein the second non-imaging light collector has an area ratio of about 2:1.

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- 8. The in-vivo tissue inspection device of claim 1, wherein the entrance of the first non-imaging light collector is sized in accordance with a particular tissue to be examined in-vivo.
- 5 9. The in-vivo tissue inspection device of claim 8, wherein the particular tissue to be examined comprises cervical tissue.
  - 10. The in-vivo tissue inspection device of claim 8, wherein the cervical tissue to be sampled is one or more of endo-cervical tissue and ecto-cervical tissue.
  - 11. The in-vivo tissue inspection device of claim 1, wherein the light guide is one of a free space connection, a hollow core light guide, or an optical fiber.
- 12. The in-vivo tissue inspection device of claim 1, wherein the optical element is one of a diffractive optical element and a holographic optical element.
  - 13. An in-vivo cervical tissue inspection system, the system comprising:
    a light source;
    a light detector; and
    the in-vivo tissue inspection device of claim 1.
  - 14. The in-vivo tissue inspection system of claim 13, wherein the light source comprises a solid state laser diode.
- 25 15. The in-vivo tissue inspection system of claim 14, wherein the solid state laser diode emits at a wavelength that is at least one of about 635 nanometers and about 850 nanometers.

16. The in-vivo tissue inspection system of claim 13, wherein the light detector comprises a blue enhanced silicon photodiode or an avalanche diode, the light detector suitable to detect fluorescence emissions at wavelengths of about 660 nanometers and about 690 nanometers.

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17. The in-vivo tissue inspection system of claim 16, further comprising a light detector comprising a gallium arsenide photodiode, the photodiode suitable to detect reflectance from a cervix at a wavelength of about 850 nanometers.

- 10 18. The in-vivo tissue inspection system of claim 13, further comprising a plurality of light sources and a plurality of light detectors.
  - 19. The in-vivo tissue inspection system of claim 13, wherein the light detector comprises an imaging array detector.

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20. The in-vivo tissue inspection system of claim 13, further comprising a source of an exogenous reagent to enhance cellular fluorescence.

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21. The in-vivo tissue inspection system of claim 13, further comprising an external housing comprising a sampling element.

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22. The in-vivo tissue inspection system of claim 21, wherein the sampling element comprises a biopsy apparatus that can be manipulated to exfoliate and collect cervical cells.

A method of inspecting cervical tissue for abnormalities, the method

comprising steps of:

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contacting the cervical tissue with an exogenous fluorescent reagent that is preferentially taken up by abnormal cells;

30 subsequently contacting the cervical tissue with light of a first wavelength; and detecting and measuring fluorescent light of a second wavelength;

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wherein the light of a first wavelength and the fluorescent light of a second wavelength are both transmitted in a non spatially-resolved manner.

- 24. The method of inspecting cervical tissue of claim 23, wherein the step of contacting the cervical tissue with an exogenous fluorescent reagent comprises application with one of a tampon, a sponge, a wipe or a brush.
  - 25. The method of inspecting cervical tissue of claim 23, wherein the step of contacting the cervical tissue with an exogenous fluorescent reagent comprises application via one of aspiration and spraying.
  - 26. The method of inspecting cervical tissue of claim 24, wherein the step of transmitting the light of a first wavelength and the fluorescent light of a second wavelength in a non-spatially resolved manner comprises transmitting the light of a first wavelength and the fluorescent light of a second wavelength through a non-imaging optical device.
- 27. The method of inspecting cervical tissue of claim 23, wherein the step of contacting the cervical tissue with the light of a first wave further comprises contacting
  20 the cervical tissue with light of a plurality of distinct wavelengths.
  - 28. The method of inspecting cervical tissue of claim 27, further comprising a step of measuring reflectance of light of a particular wavelength selected from the plurality of distinct wavelengths.
  - 29. The method of inspecting cervical tissue of claim 23, wherein the exogenous fluorescent reagent is selected from the group consisting of a photodynamic therapy reagent, an immuno-histochemical reagent, and a molecular probe.
- 30. A cervical screening method for screening cervical tissue, the method comprising steps of:

applying an exogenous reagent to the cervical tissue, the exogenous reagent configured to cause abnormal cells to provide a discernable response to incident light;

contacting the cervical tissue with an incident light sufficient to cause the discernable response to the incident light, the discernable response comprising emitted light of a particular wavelength;

using a non-imaging light collector to gather and concentrate the emitted light; and

impinging a detector with the gathered and concentrated light.

- 10 31. The cervical screening method of claim 30, wherein the step of using a non-imaging light collector comprises using at least one compound parabolic collector.
  - 32. The cervical screening method of claim 30, wherein the step of using a non-imaging light collector comprises using at least one compound elliptical collector.
  - 33. The cervical screening method of claim 30, wherein the step of impinging a detector comprises using an optical element comprising a diffractive optical element in order to polarize the gathered and concentrated light.
- 20 34. The cervical screening method of claim 30, wherein the step of contacting the cervical tissue comprises passing the incident light through a non-imaging collector.
- 35. The cervical screening method of claim 30, wherein a filled non-imaging collector is used to screen cervical tissue comprising endo-cervical tissue.
  - 36. The cervical screening method of claim 30, further comprising a step of obtaining a sample of the cervical tissue in response to an indication of abnormality.

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